The $I_{K,R}$ blockers, 3 μM E 4031 and 1 μM dofetilide reduced $I_{K,tail}$ in SAN cells by 45% and 50%, respectively, and both agents blocked $I_{K,tail}$ nearly completely in AVN cells.

Conclusions: These results suggest that I_K in SAN cell is composed of both $I_{K,R}$ and probably I_{Ks}, whereas I_K in AVN cells is generated entirely by $I_{K,R}$. This difference in the distribution of $I_{K,R}$ in nodal cells is important for understanding the modification of the automaticity and refractoriness by this antiarrhythmic agent.

906 Surgical Valve Replacement and Repair

Wednesday, April 1, 1998, 4:00 p.m.–5:00 p.m.
Georgia World Congress Center, Room 364W

4:00

906-1 Impact of Prosthesis-Patient Mismatch on Hemodynamic and Clinical Status in Patients With an Aortic Valve Bioprosthesis

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The objective of this study was to determine if prosthesis-patient mismatch has a detrimental effect on the patient's hemodynamic and symptomatic status and morbidity and mortality. A cohort of 392 patients was followed for up to 7 years after implantation of a Medtronic Intact bioprosthesis. Doppler echocardiography was performed yearly in a subgroup of 72 patients. Evidence of mismatch (MM) was defined as an indexed valve area ≤ 0.85 cm^2/m^2. Mismatch was associated with worse postoperative functional class ($p < 0.01$) independently of other significant predictors such as age and preoperative functional class but had no significant impact on patient survival (MM: 75 ± 4%, no MM: 79 ± 3%, $p = 0.59$) and valve related morbidity up to 7 years. There was tendency for lower freedom from congestive heart failure at 5 years in patients with MM (85 ± 3% versus 93 ± 2%, $p = 0.05$) but this difference did not reach statistical significance in the multivariate analysis. Cardiac index was similar in patients with and without MM for up to 3 years after operation but decreased significantly thereafter only in patients with MM (−0.54 ± 0.32 L/min/m^2 vs. −0.17 ± 0.49 L/min/m^2, $p = 0.04$). Likewise, the mean transprosthetic gradient which was higher at 1 year after operation in patients with MM (22 ± 8 mmHg versus 15 ± 7 mmHg, $p < 0.05$) increased significantly (+6 ± 6 mmHg vs. +1 ± 1 mmHg, $p < 0.001$) during follow-up only in this group. In conclusion, patients with mismatch have less symptomatic improvement and worse hemodynamics that continue to deteriorate during follow-up. However, medium-term (up to 7 years) prognosis is relatively good. Further studies are necessary to determine the longer-term effects of mismatch, if any, on mortality and morbidity.

4:15

906-2 Long Term Results of Homograft Aortic Valve Replacement in Patients With Congestive Heart Failure

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The impact of valve type on the long term outcome following aortic valve replacement (AVR) in patients with congestive heart failure (CHF) is not well characterized. Homografts offer excellent hemodynamic function but need replacement after a varying number of years. We reviewed 518 patients (aged 15–85 years) with aortic valve disease and NYHA class III–IV dyspnoea who had their initial AVR at our hospital over a period of 25 years: 381 had a homograft (H), 90 a mechanical valve (M) and 47 a stented xenograft (X). 30-day mortality was 7% (5% for H). Crude survivals ± standard error at ten years were 65 ± 2, 52 ± 7, and 59 ± 9% for patients with H, M and X respectively. M was an independent adverse risk factor in a Cox regression model, along with male sex, preoperative pulmonary edema/congestion, age, cross-clamp time, and operation before 1975. Long-term valve-related complication rates varied between valve types (e.g. thromboembolism 1.7 ± 0.2, 3.0 ± 0.8, and 1.2 ± 0.7%/pt.yr; anticoagulant-related bleeding 0.2 ± 0.1, 2.1 ± 0.7 and 0.8 ± 0.6%/pt.yr; endocarditis 0.4 ± 0.1, 0.2 0.1 and 1.2 ± 0.7%/pt.yr for H, M and X respectively; all $p < 0.05$). The rate of primary tissue failure of H and X (3.9 ± 0.3 and 1.2 ± 0.7%/pt.yr, $p < 0.05$) reflected the age of the patients (54 ± 15 vs 70 ± 9, $p < 0.0001$) and shorter max. follow-up of X (27 vs 14 years). However, the overall incidence of serious complications and cardiac deaths was independently reduced by a homograft AVR. Thus, homograft AVR in patients with CHF offers a good long term outcome.

4:30

906-3 Initial Echocardiogram After Mitral Valve Reconstruction Predicts Durability of Repair

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Background: Doppler echocardiography has been shown to provide an accurate assessment of mitral valve anatomy and function after mitral valve reconstruction. We sought to predict by transthoracic echocardiography the durability of both good and moderate results by echocardiographic criteria.

Methods: From 1/79 through 1/97, 735 patients (pts) underwent mitral valve reconstruction. Patients were serially followed with both clinical evaluation and transthoracic echocardiograms on a yearly basis. Two hundred ninety-five pts had sequential echocardiographic follow-up and are the subject of this report. Time frames analyzed were within the first 6 month intervals and then yearly. Mitral insufficiency (341) was scored 0 (none), 1 (mild), 2 (moderate) and 3 (severe) based on color doppler. If more than one evaluation was obtained within a time period, the values were averaged. Fifty-two of these patients had echocardiographic follow-up greater than 3 years.

Results: Results are shown below (* $p < 0.001$ by chi-square test).

Initial MI	Freedom from Reop	Mean MI Score			Follow-up NYHA class
		Initial	1 Yr	3 Yrs	
0–1	242/256 (97.3%)*	0.47	0.84	0.67	1.4
2	22/25 (88.0%)	1.99	2.00	1.33	1.8
3	4/14 (28.6%)	2.69	2.00	–	2.8

Conclusions: In those pts with no or mild MI initially after reconstruction there was low risk for reoperation and follow-up echocardiograms showed little change over time. Those pts with severe MI are at a greatly increased risk for reoperation. Patients with moderate MI also have an elevated risk for reoperation; however, the degree of insufficiency does not appear to change over time. Thus, patients with moderate mitral insufficiency after mitral reconstruction are at low risk for progression of disease and maintain good functional status.

4:45

906-4 Carpentier-Edwards Pericardial Bioprosthesis at the Mitral Site: Twelve Year Results

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Background: Pericardial bioprostheses provide superior haemodynamic function, lower rates of thromboembolic events and endocarditis when compared with Porcine valves. Valve life has, however, been a major concern with the Pericardial valves.

Method: To evaluate the clinical performance of the Pericardial Bioprosthesis at the mitral site, we reviewed 90 patients [29 males, 61 females; mean age 60 years (range 22–77 yrs)], between 1984–1989. There were 82 single replacements and 8 double replacements (mitral and aortic). Pre-operatively 86% of patients were in NYHA functional class III or IV, 47% had atrial fibrillation, 19% previous mitral valvotomy and 3% previous mechanical valve replacement with rheumatic valve disease the predominant aetiology (46%). By the closing date followup was 98.8% complete, averaging 76 months with a total cumulative follow-up of 561.7 patient years. Standard Edmunds guidelines were used for evaluation.

Results: The 30 day hospital mortality was 13% [95% CI 6.3–20.4]. Valve related deaths (early 0, late 5) were 11% of the total deaths. Late mortality rate was 4% per patient year. Patient survival at 12 years was 49.5% (SE 3.4%). Valve related complication rates and freedom from valve related events are as follows:

Events	Rates (%patient year (episodes)	Freedom at 12 years
Thromboembolism	1.6 (n = 9)	83.0% (SE 3.8)
Haemorrhage	1.2 (n = 7)	91.2% (SE 3.2)
Bacterial endocarditis	0.0 (n = 0)	100% (SE 0.0)
Non-structural failure	0.9 (n = 5)	92.0% (SE 3.3)
Structural failure	0.9 (n = 5)	90.9% (SE 3.1)
Re-operation	1.1 (n = 6)	89.1% (SE 4.1)

At follow-up 93.5% survivors were in NYHA functional class I or II.

In conclusion, our experience with the Carpentier-Edwards Pericardial Bioprosthesis suggests that it continues to provide satisfactory clinical performance at the mitral position with low complication rates.